

Zero Retries issue 0039 2022-03-25

Special Note - For easier reading and reference, the content of this issue, and Zero Retries 0040 (2022-04-01 - “Zero Retries Interesting” Projects and Systems - Part 2 of 2) were consolidated on a web page - [Zero Retries Projects Etc. from ZR 0039 and 0040](#).

Advanced Amateur Radio - Data Communications; Space; Microwave... the fun stuff! The Universal Purpose of Ham Radio is to have fun messing around with radios - Bob Witte K0NR. Ultimately, amateur radio must prove that it is useful for society - Dr. Karl Meinzer DJ4ZC. We are confronted by insurmountable opportunities! - Pogo. Nothing great has ever been accomplished without irrational exuberance - Tom Evslin. Irrational exuberance is pretty much the business model of Zero Retries Newsletter - Steve Stroh N8GNJ. What's life without whimsy? - Dr. Sheldon Cooper.

Zero Retries is a unique, quirky little highly independent, opinionated, self-published newsletter about technological innovation in Amateur Radio, for a self-selecting niche audience, that's free (as in beer) to subscribe.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Request To Send

Countdown to [Hamvention](#) 2022 - May 20-22, in Xenia, Ohio - 8 weeks...

The topics I discuss in Zero Retries are... varied (to be charitable). I do try to keep them roughly aligned with the theme *Technological Innovation in Amateur Radio*. In my mind (as Editor), these varied topics are a continuum, but as new subscribers trickle in, I certainly don't blame them for not exhaustively reading the 39 previous issues (and counting) of Zero Retries

to get up to speed. Some *have* tried 😊 I think I've hit upon two solutions.

The first is that beginning this issue, and concluding with the next issue, I will devote each “decade” issue of Zero Retries to a brief rundown of the various “Zero Retries Interesting” projects I’m aware of. I began this intending it to run in Zero Retries 0040, but I overflowed. I know... shocking, right? 😬

Somehow, beginning with Zero Retries 0050 (approximately mid-June, 2022), I will winnow down all the “Zero Retries Interesting” entries to fit into a *single* issue of Zero Retries, even if what’s required to do so is as minimalist as reducing each entry to a name and embedded website link. Those “decade” issues won’t be a static list, merely reprinted every ten issues, but each “decade” issue will evolve as new projects emerge, and old projects age out. Compiling this initial list was a lot of work, but fortunately I had a bit of a [head start](#).

The second solution is to go old school and *write a book*. I’ll keep the title undisclosed until I’m further along in the project. Imagine each of the subject areas (and many more) in this issue and next as a chapter, and instead of a few sentences devoted to each project, there are paragraphs of descriptions about why that particular project, etc. is relevant to Amateur Radio in the 21st century. Perhaps there will even be *illustrations*!

More details on the book will emerge in future issues of Zero Retries, including how Zero Retries subscribers and especially supporters that feel that *there should be such a book* to help me make it a reality.

de Steve N8GNJ

“Zero Retries Interesting” Projects and Systems - Part 1 of 2

This article should not be considered comprehensive, and lack of inclusion here should not be considered as lack of endorsement as “Zero Retries Interesting”. Much good stuff was not included simply due to limited space. Apologies in advance for terse / incomplete descriptions - see the links for detail.

Many of these have been discussed previously in Zero Retries - just search:

Search Zero Retries

Awards / Recognition

[Amateur Radio Software Award](#) - “Promoting software projects that enhance and adhere to the spirit of amateur radio: innovative, free and open“.

[ARRL Technical Awards](#) - Annual awards for Technical Service, Technical Innovation, Microwave Development, and “Doug DeMaw W1FB Technical Excellence Award“.

[Hamvention Awards](#) - Annual awards for Special Achievement and Technical Achievement.

Books

[Ham Radio for Dummies](#) - I gift this book to prospective and new Amateur Radio Operators in my circles; it's a great overview.

[Ham Radio's Technical Culture](#) - Dated and out of print, but still interesting.

Events

[Digital Communications Conference \(DCC\)](#) - Primary development conference for Amateur Radio.

[GNU Radio Conference](#) - (Amateur Radio adjacent) A week of full immersion in Software Defined Radio.

[Ham Radio Village at DEFCON](#) - Amateur Radio is attracting interest at DEFCON!

[MicroHAMS Digital Conference \(MHDC\)](#) - Smaller version of DCC in Seattle area.

Mailing Lists

[HamSCI](#) - Ham Radio Science Citizen Investigation (see Organizations)

[New Packet Radio](#) - Users of New Packet Radio systems.

[Raspberry-Pi 4 Ham-Radio](#) - Wide ranging discussions about using Raspberry Pi in for Amateur Radio.

Modems / TNCs (Sans Radio)

[DigiLink Nano](#) - Compact audio interface, good for use with portable radios.

[Digirig](#) - Compact audio interface, good for use with portable radios.

[Masters Communications DRA series](#) audio adapters - Best performance for using high speed "audio interface modes" such as VARA FM.

[Multi Mode Digital Voice Modem \(MMDVM\)](#) - Open source project, hardware, and software that Incorporates and translates [transcodes] various Digital Voice standards such as D-Star, DMR, System Fusion, and P25.

[Mobilinkd TNC3](#) - Bluetooth APRS TNC with battery power and 1200 / 9600 bps KISS TNC

for use with portable radios.

[NW Digital Radio Amateur Radio ThumbDV](#) - Easiest method for experimenting with mostly-software approaches to Amateur Radio Digital Voice modes; incorporates the most common (hardware) CODEC in use in Amateur Radio.

[Nexus DR-X](#) - A kit that uses a Raspberry Pi 3 or 4 for multiple Amateur Radio modes. Tightly coupled, well-maintained software makes this system easy to use.

[NinoTNC](#) - A “from scratch” KISS TNC designed specifically to support [Terrestrial Amateur Packet Radio Networks \(TARPN\)](#). The NinoTNC supports AX.25 packet radio at 1200 / 2400 / 4800 / 9600 bps and various modulation methods. The Nino TNC also supports Improved Layer 2 Protocol (IL2P) Forward Error Correction (FEC).

Media

[APRS.fi](#) - Best known, highest traffic web page of APRS in action. Particularly useful for high altitude balloon flights, etc.

[APRS.org](#) - The “APRS Omnipedia” created by Bob Bruninga WB4APR (Silent Keyboard) and is the most comprehensive reference on APRS (at the moment).

[Amateur Radio Digital Communications \(ARDC\) Grants Awarded](#) - When a grant is awarded, a brief description is posted. No RSS - requires manual polling.

[Broadcastify](#) - (Amateur Radio adjacent) Web feeds of two-way radio traffic, mostly public safety, but some Amateur Radio. In my opinion every Amateur Radio repeater ought to have a Broadcastify feed.

[Digital Library of Amateur Radio & Communications \(DLARC\)](#) - (In progress - grant awarded) - A dedicated section of Internet Archive for Amateur Radio.

[Experimental Radio News](#) - (Amateur Radio adjacent) Features selected FCC Part 5 Experimental Licenses. Highly recommended - you’ll learn a lot.

[Hackaday](#) - (Amateur Radio adjacent) Popular blog that often features Amateur Radio as an enabling, useful technology for self-education about radio and wireless technology.

[Internet Archive](#) - (Amateur Radio adjacent) See DLARC above; already a source of historical Amateur Radio information including the complete run of 73 Magazine.

[Linux in the Ham Shack Podcast](#) - LHS (weekly) often features “Zero Retries Interesting” projects and systems. *This entry updated 2022-03-25 after email version was sent.*

[Microwave Amateur Radio](#) - Amateur Radio Microwave info.

[OpenWebRX](#) - “Multi-user SDR receiver that can be operated from any web browser.”

[QSO Today Amateur Radio Podcast](#) - Interviews (weekly) with notable Amateur Radio Operators, a significant number of whom are “Zero Retries Interesting”. *This entry updated 2022-03-25 after email version was sent.*

[Repeater Builder](#) - Omnipedia for building and maintaining repeaters.

[RepeaterBook](#) - Independent online directory and pocket computer apps of Amateur Radio and GMRS repeaters.

[Reverse Beacon Network](#) - Worldwide network of receivers linked via Internet.

[RTL-SDR](#) - In addition to selling software defined receivers, it's a popular blog for news about software defined radio devices.

[UHF-Satcom](#) - (Amateur Radio adjacent) Satellites don't just use microwave frequencies; good info for monitoring satellites that operate at UHF frequencies.

[World Radio History](#) - (Amateur Radio adjacent) Archive of technical and Amateur Radio magazines, including Popular Electronics, Radio Electronics, and *many* others.

Networking

[APRS-IS](#) - Network of Internet servers that enables APRS iGate for APRS nodes to send local information to the Internet and make APRS data viewable on a web browser.

[Amateur Radio Emergency Data Network \(AREDN\)](#) - Replacement firmware for Wi-Fi and Wireless Internet Service Provider (WISP) radio units that reconfigure the hardware for the Amateur Radio portions of spectrum in the 2.3 GHz and 5.8 GHz bands, with features and capabilities that make it relatively easy to build Amateur Radio microwave IP networks.

[Amateur Radio Internet Exchange \(ARIX\)](#) - “internet exchange point for licensed amateur radio operators for the use of networking research, development, and education.”

[BrandMeister](#) - Independent network of DMR repeaters; encourages experimentation including text messaging, most widely used such network in Europe.

[HamWAN](#) - Microwave IP network system developed in the Seattle, Washington area; uses 5.9 GHz and 44Net IP addresses.

[IRCDDDB](#) - Independent network of D-Star repeaters.

[Highspeed Amateurradio Multimedia Network \(HAMNET.EU\)](#) - High speed microwave IP network in Europe.

[Multipurpose Remote Nodes](#) - Remotely configurable Winlink / APRS / other nodes.

[Winlink](#) - Highly reliable bridge between sending email via Amateur Radio and Internet email, widely used for Emergency Communications (EMCOM).

Organizations

[Amateur Radio Digital Communications \(ARDC\)](#) - Provides substantial grants to Amateur Radio, research, and education. Also administers 44Net, the IPv4 address block (44.0.0.0/9, 44.128.0.0/10) allocated for Amateur Radio worldwide.

[APRS Foundation](#) - In formation in 2022, this organization was formed in the wake of the death of Bob Bruninga WB4APR, the creator of Automatic Packet Reporting System (APRS) to potential coordinate the further development of APRS.

[Ham Radio Science Citizen Investigation \(HamSCI\)](#) - Sponsors scientific investigations involving Amateur Radio operators and Amateur Radio spectrum.

[TAPR](#) - In the early 1980s, created the TNC-2 that popularized Amateur Packet Radio.

Radios / Radio Systems (A - M)

[BITX HF Radio Kits](#) - Simplified HF radio kits, reasonable transmit power, and include multiple bands and SSB capability; good for data modes.

[Halo TD-XPAH](#) - (Overlaps with Amateur Radio) Crowdfunded (in progress) radio for 902-928 MHz based on 802.11ah and 802.11s.

[Ham Radio Projects SHARI PiHat](#) - Kit (or optionally, assembled) that integrates a ~0.5 watt (144-148 or 440-450 MHz) radio, modem, and a Raspberry Pi 4.

[HobbyPCB Radio Shield RS-UV3A](#) - 200 mW radio for 144-148 / 222-225 / 440-450 MHz that can be controlled via serial port and ATDT commands.

[Icom ID-RP1200VD](#) - 3rd generation D-Star repeater for 1200 MHz offers data speeds of “128 kbps”. The compatible user radio is the [Icom IC-9700](#).

[Kenwood TM-V71A](#) - Discontinued, but can still be found for sale new; good radio for data communications with a flat audio interface and remote control of almost all parameters.

[M17 Project](#) - Creating an open source equivalent of Digital Mobile Radio - voice CODEC, text messaging, protocols, network, hardware, etc.

“Zero Retries Interesting” Projects and Systems - Part 2 of 2

This series concludes in Zero Retries 0040, to be published 2022-04-01, with:

- Radios / Radio Systems (N-Z)
- Satellite / Space

- Software
 - Software Defined Radio / Receivers / Transceivers
 - Special Mention / Unique Category
-

Submit *Your* Ideas for “Zero Retries Interesting”

Nominations for the next edition of this list in Zero Retries 0050 (approximately mid-June, 2022) are welcome! To avoid losing good ideas (you wouldn't believe my email...), please go to [this form](#) to submit your suggestion.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Closing the Channel

- In its mission to highlight technological innovation in Amateur Radio, grow Amateur Radio, and make it more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex!
- My ongoing Thanks to Tina Stroh KD7WSF for, well, *everything* and Bill Vodall W7NWP as *Zero Retries Instigator in Chief*.
- My ongoing Thanks to pseudostaffers [Dan Romanchik KB6NU](#) and [Jeff Davis KE9V](#) for continuing to spot, and write about “Zero Retries Interesting” items on their respective blogs that I don't spot on my own.
- [Southgate Amateur Radio News](#) consistently surfaces “Zero Retries Interesting” stories.
- The [Substack email publishing platform](#) makes Zero Retries possible. I recommend it for publishing newsletters.

Substack has an IOS App! If you read Zero Retries on an **iPad** or **iPhone**, the [Substack Reader app](#) might be a [more pleasant reading experience](#) than email, web, or RSS. An Android app is apparently coming soon - [sign up](#) to learn when it's ready.

If you see something interesting mentioned in Zero Retries and would like to search all the Zero Retries “Back Issues”, that's now easy - just click:

Search Zero Retries

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click:

Subscribe now

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries is on Twitter @ZeroRetries - just click:

[Zero Retries on Twitter](#)

Please tell your friends and co-conspirators about Zero Retries - just click:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy; yes, you guessed it... just click:

Leave a comment

Email issues of Zero Retries are “instrumented” by [Substack](#) to gather basic statistics about opens, clicking links, etc. I don't use such information in any way other than seeing that most subscribers actually do read Zero Retries.

All previous issues of Zero Retries are available without restriction (no paywalls). For some background, Zero Retries 0000 was the **Introduction Issue**. Zero Retries 0026 and Zero Retries 0027 were a **2021 Year End Review** of Zero Retries. Every “decade” issue of Zero Retries is an overview of “Zero Retries Interesting” projects, etc.

More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted in beautiful Bellingham, Washington, USA

2022-03-25

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Packet Status Register (PSR) newsletter (I *owe* them from *way* back).
